

August 2016

Stock Market Simulation

Perry J. Ascani
Worcester Polytechnic Institute

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Project Number: DTZ 1605

An Interactive Qualifying Project Report: submitted to the Faculty of

WORCESTER POLYTECHNIC INSTITUTE

in partial fulfillment of the requirements for the

Degree of Bachelor of Science

By

Perry Ascani

Submitted:

August 12, 2016

Approved by Professor Dalin Tang, Project Advisor

Abstract

Through researching methods and tools used for stock trading, a seven-week simulation was conducted to learn how to implement those strategies through active trading. The simulation was executed using online finance websites by tracking stock performances and performing theoretical trades. The results of the stock portfolio were compared to other investment vehicles to rank their return on investments. This simulation was intended to learn first hand investing experience for future application.

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Chapter 1 – Introduction

1.1 Goals and Methods

The goal of this stock market project was to use a seven-week simulation to gain first hand experience with stock market investments. Using a five hundred thousand dollar initial investment, a portfolio was maintained over the course of seven weeks to purchase stocks in five to seven companies at a time. During the simulation, research into historical trends, different markets, and different trading methods all helped to influence trades and future investments. After the seven-week simulation was completed, conclusions were made based on the final value of the portfolio in comparison to the initial investment. Conclusions were also drawn to compare the investment in the stock market to how the investment would have grown if it were placed in other investments such as interest accruing accounts.

1.2 History of the Stock Market

The concept of trade can be traced back to the earliest knowledge of human interaction. Traceable models of exchange draw back to the 1300's in Europe. However, it was not until the late 18th century that an exchange was formalized in the United States. In 1790 the federal government issued roughly \$80 million in bonds to repay the debt caused by the Revolutionary War and, in doing so, dawned the beginning of the U.S investment market. ¹

Soon thereafter, on May 17, 1792, the New York Stock Exchange was born when twenty-four brokers signed the Buttonwood Tree Agreement in New York to begin trading securities. ¹ The agreement created a private union in which members were to trade with each other exclusively at a 0.25% commission rate. The group focused primarily on government bonds and bank stocks. ²

Twenty-five years later, in March 1817, New York brokers established the New York Stock & Exchange Board and moved to the infamous Wall Street of New York. Since its inception, the NYSE has negotiated in the trading of stock and dominated a majority of business and trade oscillating from the United States.¹ After the War of 1812 the United States saw increased commercial activity. This, along with speculation in railroad stocks in the years after, resulted in increasing demand for capital and, consequently, trading at the NYSE. Later on, the exchange would provide capital for the rapid industrialization of the United States.³ The NYSE materialized as an incredibly wealthy institution as it did not face significant domestic competition in the first twenty years of its existence.

The function of the stock market has evolved from its days of paying off the Revolutionary War. Today, companies can offer stocks to investors with the purpose of raising capital. In return for their initial investments in companies, the investors generally receive returns once those companies begin making profits. If the company becomes profitable, its stocks have the potential to become highly sought after which then drives the prices of its stock upward. When stock prices are high, investors have the opportunity to sell their shares and turn over profit.

Today the primary purpose of the stock market is to regulate the trading of stocks and other financial assets as previously discussed. By regulating these trades, the stock market guarantees fair methods and processes for investors and the corporations being traded at the exchange. The status of the market is often an indication of how the economy is doing as the stock market can influence the health of the financial economy either in a positive or negative manner.⁴

1.3 NYSE vs. NASDAQ

The National Association of Securities Dealers Automated Quotations (NASDAQ) Stock Market is an American stock exchange. It is the second-largest publicly traded corporation, the New York Stock Exchange being the first. When one thinks of the stock market both the NYSE and NASDAQ come to mind. While both are leading competitors with unmarked dissimilarities the fundamental difference between the two exchanges is the method in which securities are traded.⁵

The New York Stock Exchange is an auction market that uses an exchange member to execute transactions from the floor of the exchange exclusively for his or her own account. In other terms, people are typically trading between one another. Unlike the New York Stock Exchange, the NASDAQ is not a physical entity but a dealer's market. The NASDAQ is located on a telecommunications network where trading is directly between investors and their buyers or sellers instead of relying on NYSE specialists to facilitate trading and liquidity in stocks. As noted earlier, this is the fundamental difference between the two markets.⁶

While not quantifiable, it is important to also recognize the correlation between companies belonging to these exchanges. The New York Stock Exchange is infamous for their perception of well-established and profitable company listings. Many of them include "blue chip", or high quality, firms and industrial companies that are considered to be both well-established and reliable investments. In contrast, the NASDAQ is known as a high-tech market specializing in leading technology, trading, and intelligence. The listings on the NASDAQ Stock Market are speculative and growth oriented as technology is ever changing. Therefore, investments in these companies are seen to be more volatile and prone to fluctuation than the

blue chip stocks of the NYSE. Perception is subjective but an important variable in which exchange a company decides to list on and who invests in what stock.⁷

1.4 Other Exchanges

In addition to the major stock exchanges, there are other exchanges from which investors can purchase securities. Securities—such as penny stocks or bonds—traded through dealer networks are commonly referred to as over-the-counter. Although the NASDAQ is also a dealers network, stocks listed on the NASDAQ are not considered over-the-counter stocks. Companies generally trade stocks over-the-counter because they do not meet the listing requirements needed to be listed in an exchange.⁸

1.5 Reasons Behind Investing

People can make money in two ways: by working or by letting your assets work for you.⁹ When considering whether one should or should not invest in exchanges like the NYSE or NASDAQ, it is important to consider the positive outcomes associated with investing because they are plentiful and common. Money is a seductress that fuels investment. When invested in things such as mutual funds, bonds, real estate, or stocks, initial investments generate more money by either interest or trade when the investment has increased in value. Historically, the stock market has returned an average of 10.5 percent on investments over the past 75 years making it best investment over time.¹⁰

Money aside, investing in something like stocks or equities gives you an opportunity to be a part owner of a business. Investors are at liberty to vote at shareholders' meetings and receive dividends that the company allocates to its owners. Investors have power and high

potential returns in stock investments. However, potential is nothing more than speculation and one must assume a counter perspective with investing, such as losing all of the investment.¹⁰

Chapter 2 – Vehicles of Investing

2.1 Introduction

Investing is the act of entrusting a set amount of money or capital in an enterprise with the hope that the original amount committed will increase in value over time, therefore generating profit. Money can be regarded as an extension of one's working capacity with investing as the medium. Investing can then be regarded as a method of maximizing earning potential. Regardless of whether one is working or enjoying leisure time, their money is putting in hours that could very well return high profits. ¹¹

There are multiple ways to make an investment. These investment vehicles come in the forms of certificates of deposits, stocks, bonds, and mutual funds among others. Each type of investment vehicle can manifest unique and always changing, positive and negative outcomes. Not to be mistaken with high risk betting, true investments are completed after careful research and comprehensive analysis. Successful investing is also contingent on the amount of work the investor committed to the investment. An investment vehicle chosen deliberately as best fitted to the needs of an investor can potentially yield high returns. ¹¹

2.2 Certificates of Deposit

The risk level of an investment is conditional to its vehicle identity. In other words, some types investments are safer than others. Certificates of deposit (CDs) are often regarded as one of the safest investment vehicles. CDs are sold by banks and are low-risk and low return investments. They are most appropriate for investors who are able to commit money for long periods of time without needing to access it during the term. Banks pay out predetermined, slightly higher, interest rates on certificates of deposit than normal checking accounts. Therefore,

investors are guaranteed to earn back everything invested originally with interest after the duration is over. In addition, the FDIC insures CDs for upwards of \$250,000 meaning the investment is safe if the bank fails.¹²

2.2.1 Traditional Certificates of Deposit

A traditional certificate of deposit has a fixed interest rate over a specific duration of time. If the agreed on term passes without any withdrawals an investor may invest in another CD or be granted full access to their money. Usually, an early withdrawal from a traditional certificate of deposit yields penalties.¹²

2.2.2 Bump-Up Certificates of Deposit

A bump-up certificate of deposit is a more characteristically flexible investment. This type of CD allows investors to upgrade to a CD with a higher interest rate if one is offered during the term. These are smart investments for speculation in future marketing endeavors.¹²

2.2.3 Liquid Certificates of Deposit

Liquid certificate of deposits allow investors to withdraw money from the account before the term is over without penalties. Oftentimes, these have lower interest rates than traditional certificates of deposit.¹²

2.2.4 Zero-coupon Certificates of Deposit

Zero-coupon certificates of deposit do not pay out annual interest like traditional CDs. In these accounts the original amount is reinvested and collects interest on a larger deposit. These types of investments are desirable because they yield a higher interest rate.¹²

2.2.5 Callable Certificates of Deposit

Callable certificates of deposit are investments made with a bank that gives the financial institution the right to release the deposit before its maturity date. The risk level of a callable CD is higher than that of a traditional CD and compensates that risk with higher interest rates.¹²

2.2.6 Broker Certificates of Deposit

Brokered certificates of deposit are CDs offered by a brokerage. The bank is the deposit holder but contracts firms to increase sales on a more competitive market. These accounts are popular because of their high interest rates.¹²

2.3 Bonds

Bonds are fixed-income securities or investments that return fixed intervallic payments with the eventual return of the original investment at maturity. Essentially, a bond is like a loan. Investors commit money to a government or corporate borrower and the borrower pays interest on the investment. Bonds are attractive to investors because they are virtually risk-free. However, the low-risk investment yields lower rates of returns.^{13,14} Corporate bonds on average returned 4.5 percent a year over the past 75 years.¹⁰

2.4 Mutual Funds

A mutual fund is a collection of stocks and bonds. With this type of investment a group of people pool their money into a professional who then selects securities for them. The investors then own shares or portions of the mutual fund. These types of investments attract people who want to invest without the experience or time. In addition, mutual funds have lower risk than

owning individual stocks because loss is minimized by dispersion among other shareholders. Therefore, mutual funds are easy, low-risk investments.^{14,15}

2.5 Hedge Funds

A hedge fund is similar to a mutual fund as they both are investment partnerships. The general partner manages the money contributed by the limited partners in order to capitalize on returns and eliminate risk. This is similar to how shareholders invest money managed by a professional manager in a mutual fund. However, hedge funds are only available to accredited investors or investors with high net worth. They also have wider investment latitude than mutual funds; this includes real estate, currencies, and derivatives in addition to stocks and bonds. Hedge funds are private investment vehicles appropriate for wealthy individuals who can handle high risk.¹⁶

2.6 Money Market

A money market is a type of fixed-income security. They specialize in short-term debt securities. It is used as a means for short-term lending and borrowing. The money market is a dealer market in which access for the individual investor is limited and securities are traded in high denominations. They are relatively low-risk and because of their safety, offer lower returns than securities previously discussed.¹⁷ Treasuries have returned an average of 3.3 percent over the past 75 years.¹⁰

2.7 Penny Stocks

Penny stocks are low cost stocks with a small market capitalization. Despite the implications of their name, there is no set price cap for what is considered a penny stock. According to the Securities and Exchange Commission, a penny stock is a stock costing less than five dollars. Penny stocks are not listed on the major exchanges but rather are traded over-the-counter. Penny stocks can be purchased through the same broker an investor uses to purchase stocks from the main exchanges. They are commonly listed in the Pink Sheets or the Over-the-Counter Bulletin Board (OTCBB).

Penny stocks are extremely volatile. On rare occasions, investors can make large profits from their cost jumping exponentially in a matter of a few weeks time. This is what makes them enticing. However, there are large risks associated with penny stocks. A downside to penny stocks is they are often hard to sell once an investor owns them, and they are hard to accurately place a value. One of the largest risks is that the SEC does not oversee stocks traded in the Pink Sheets. Penny stocks can also be traded for shell companies, which are companies that do not have any actual business operations. These shell companies are often times part of a pump and dump scam, which is when investors are tricked by brokers into buying their stocks at inflated rates. ¹⁸

Chapter 3 – Trading Strategies and Tools

3.1 Introduction

There are several ways stock market investors make their decisions on how to trade securities. Most methods are considered to be active trading. Active trading is short-term investing and there are various methods investors can use to utilize active trading. Investors look for patterns in market movements to buy and sell securities at opportune moments where they buy at a lower price than they trade at.¹⁹ The following sections discuss the most common methods and strategies of investing, as well as common advice from expert stock traders.

3.2 Long-Term Investing

There are two types of investments in the sense that there are long-term investments and short-term investments. Generally investments that are held for a year or longer are categorized as long-term investments. This includes stocks and bonds. The most common long-term strategy is referred to as the buy-and-hold strategy. Long-term stock investments may never be sold unlike short-term investments.²⁰ Trend following can also be seen as a long-term investment. A security would be held for a longer period of time while a trend has a stock price ascending, and it would hold a shorter position when a trend is forcing a loss. When using trend following, a trader will hold the security until the trend changes. Seasonal trends are an example of this investment strategy. It is considered trend following when one buys stocks in a company right before a spike during a particular season that reoccurs year after year.

3.3 Growth vs. Value Investing

It is important to identify the stocks in one's portfolio on an individual basis as a growth stock or a value stock. Every investor will see them differently as their definitions vary greatly with individual perception. An investor should perceive them as the ends of a continuum. If he or she can identify how a stock falls on that continuum they can then understand why they purchased it and, ultimately, understand when they will sell it.

Growth companies are those with great potential. They are often times well-known companies that lead in their respective industries. They have been successful in the past and are expected to continue growing. Growth investors generally will pay high prices for growth stocks because they believe their investments will earn money from capital appreciation. Many growth companies do not pay dividends. Instead, they reinvest that money into new projects or expansion that ultimately generates more profit, causing the stock price to rise. Growth investors look at high price-to-earnings (P/E) ratios and high price-to-book ratios to identify companies in which to invest.²¹

On the opposite end of the spectrum, there are value stocks. A value stock, by definition, is a stock that is undervalued by the market. In contrast, they have low price-to-earnings (P/E) ratios and low price-to-book ratios. These are companies that may have experienced recent difficulties causing their stock prices to plummet. Investors expect these companies' operations to experience a recovery driving their stock prices back. A value stock is therefore purchased at a discounted price in relation to its potential. A value stock may also be associated with a new company that has yet to be discovered by many investors.²¹

The majority of investors will have both growth and value stocks in their portfolios. Each has their own risks, as securities are not guaranteed to be sold at a higher price than for which

they are purchased. Therefore, it is important to understand that both value and growth investments can experience cycles where one investment proves to be a better investment than the other. ²¹ Identifying companies somewhere on a spectrum can help illuminate when an investor should sell their shares or, perhaps, even purchase more.

3.4 Day Trading

The day trading strategy is the shortest investment method. An investor will purchase and sell a security within the same session. This means he or she will buy a stock and sell it between the open and close of one session, i.e. business day, of that exchange. For the most part, this investor would not hold the security over night. However, in a rare case a position may be held over night if the upward trend of the stock is believed to continue. Some investors may also hold onto the investment because they do not want to sell it at a loss and hope that the price will rise again. ²²

3.5 Swing Trading

Swing trading is a short-term investing strategy in which traders search for price volatility to indicate a executing a trade. The duration of a swing trade would typically be between a few days to a few weeks. Swing traders generally have distinct personal guidelines they follow for determining fluctuations in the market. As a price bounces between a high and low range, a swing trader will sell when they predict the peak price has occurred or when their target profit is reached. Swing traders will be constantly looking through markets for oscillations to make their next move. They will make their investments more frequently than a trend follower because they are holding their securities for a shorter period of time. ²³

3.6 The CAN SLIM System

The CAN SLIM model for investing was presented by William O'Neil, the founder of *Investor's Business Daily*, in his 1988 book *How to Make Money In Stocks*. O'Neil used profits he made from stock trading to fund his own investment research organization in Los Angeles. CAN SLIM is an acronym for seven attributes for which a company must possess in order for O'Neil to invest in their stock. O'Neil states that when compared to the same quarterly earnings from the previous year, the current quarterly earnings must be higher. O'Neil wrote, "the percentage increase in earnings per share is the single most important element in stock selection today."¹⁰ In addition to the quarterly earnings, annual earnings per share must also be accelerating. The company should have something new that is positively affecting the company's future. This attribute could include anything from a new product to a new management team. His research found that the supply of stock must be low and the demand must be high. The fifth attribute is that a company must be a leader in the industry. Institutional buyers, such as mutual funds and pension plans, should be also buying this company's stock, because this demand will help drive the price of your stocks up. The last indicator is that even if you pick a winner in all of the other categories, if the market's direction is downward, more than seventy-five percent of the time, your stocks will decline with it.¹⁰

3.7 News Trading

News Trading is a type of trend following. It is a technique that relies on recent current event "news" to speculate if a market will fluctuate. A current event could include anything from terrorist attacks, company merger rumors, natural disasters, or employment rates. These news stories are broadcasted through a plethora of platforms including newspapers, television, radio,

internet, and even social media. The idea is that investors are relying on reactions to current events that may drive the market up or down in their decision to invest.²⁴

In the media age, news trading can yield high profits, as news is readily available. However, the reaction window of opportunity is a small one so investors who rely on news trading must make investments quickly. Therefore, the risk factor is high because news trading is founded on speculation in narrow time windows. Risk can be lowered with new trader etiquette that involves scrutinizing news sources, their biases, level of believability, and potential interpretation.²⁴

3.8 Fundamental vs. Technical Analysis

Fundamental analysis and technical analysis are the two ways to scrutinize a stock. Fundamental analysis uses a company's financial statements—like the balance sheet, cash flow statement, and income statement—to place a value on its stocks. These financial statements and additional data are evaluated for the company over several years. This kind of analysis is generally used for a long-term investments and growth stocks. An investor will look at a company's revenue, expenses, assets and liabilities because they hope to gather insight about a company's future.²⁵

Technical analysis ultimately relies on the price movements of a stock in the market to speculate a stock's price. Using different charts and calculations, technical analysis tells its users the supply and demand for those stocks in its respective market. This information is useful for determining what trend the market will follow in the future. Technical analysis differs from its fundamental counterpart in the sense that trends can be spotted using data from short periods of

time such as weeks down to minutes. Due to the nature of trends, technical analysis is usually used for short term trading as opposed to investing.²⁶

3.9 Terminology

3.9.1 Indexes

When analyzing the performance of stocks, it is important to compare them to the performance of the market. Market indexes are groups of stocks that are combined to give a benchmark or reference point as to the health of its corresponding exchange. These indexes can be tracked over time, thus giving a comparison to one's own stock during that same time period. The most well known index is the Dow Jones Industrial Average (DJIA), which tracks 30 stocks that are traded on either the NYSE or the NASDAQ. The NASDAQ Composite Index tracks 4,000 stocks that belong only in the NASDAQ National Market, and the Standard and Poor's 500 Index, S&P 500 tracks 500 large-cap U.S. stocks.²⁷

3.9.2 Stock Splits

A stock split occurs when a company divides its shares into multiple shares. This action increases the number of shares without increasing shareholders' equity; in other words, the total amount an investment is worth has not increased although the number of their shares has increased. Companies split their stocks to make shares more affordable.¹⁰ If companies make their stocks more affordable to investors, it broadens the investor base; the stock is now available for smaller investors to purchase. Analysts and professional investors will often agree that these stocks trading at lower prices improve their liquidity and, therefore, make them more valuable.²⁸

Historically, companies will split their stocks because they are optimistic that the price will continue to climb.

3.9.3 Relative Strength Index

The relative strength index (RSI) is an indicator that is used to attempt to identify overbought or oversold conditions for the stock of a specific company. Jason Kelly explained how the RSI works by saying it “compares an investment’s current price with its past performance to gauge current strength.”¹⁰ The common timeframe for the RSI is fourteen days. It is thought that if the RSI stretches too far towards overbought or oversold conditions that it will bounce back in the opposite direction, which indicates a trade. The RSI is a number between 0 and 100. A buy is indicated as a value below 30, and a sell is indicated by a value over 70.¹⁰ The RSI indicator can be viewed on interactive stock charts and an example can be seen below in Figure 1.



Figure 1 - Example of Relative Strength Index Indicator²⁹

3.9.4 Simple Moving Average

The simple moving average (SMA) is an indicator that is used to smooth out a stock's price line to make it easier to identify its trend. If the price is staying above its SMA line on a chart, it is depicting an uptrend; if the price is staying below its SMA line, it is showing a downtrend. Common settings for simple moving averages are 50, 100, and 200 days. If the price line dips below the SMA on an upward trend, it indicates a buy. If the price line rises above the SMA line on a downward trend it indicates a sell.¹⁰

3.9.5 Key Statistics

When evaluating companies for investment potential, there are several different resources available to investors. Each investor looks at different statistics to analyze his or her portfolio. Three common statistics found in investor workbooks are earnings per share, current ratio and price/earnings ratio. The earnings per share (EPS) is the net income of a company subtracted by dividends on preferred stock all divided by the number of outstanding shares. A negative earnings per share value indicates that a company lost money last year or last quarter, depending on how the EPS is calculated. The price/earnings ratio (P/E) takes the current price of the stock and divides it by the earnings per share. Since the price of the stock is always changing, the P/E ratio is also constantly changing. It's riskier to invest in a stock with a higher P/E ratio because it means a buyer is paying a high price in comparison to its earning potential. The current ratio is simply the company's current assets divided by the company's current liabilities. The current ratio is a gauge of how much cash, inventory and accounts payable it has to pay off the company's short-term debts.¹⁰

Chapter 4 Company Profiles

4.1 Boston Beer Co. Inc (SAM)

The Boston Beer Company, Inc. was founded in 1984 in Boston, Massachusetts. The founder, Jim Koch, used a family recipe to brew Samuel Adams Boston Lager, which he named after the famous patriot. The idea behind the company was to introduce craft beer to replace the flavorless mass-produced beers of the time. The corporation sells many different adult beverages that are well known in the brewing industry. These brands include Samuel Adams, Twisted Tea, Angry Orchard, and Alchemy & Science. In 2014, the Boston Beer Company sold more than 4.1 million barrels of product, making them one of the largest craft breweries in the United States.³⁰

The Boston Beer Company went public in 1995 offered investors shares of Class A Common Stock on the New York Stock Exchange under the ticker SAM. The company was selling one unit of thirty-three shares for \$495.00 or one share for \$15.00. This IPO was marketed to individual investors through coupons attached to product.³¹ Since going public the company has been averagely profitable with the exception of overall dips in the market like those seen during the 2008 recession.

4.2 Exxon Mobil Corporation (XOM)

Exxon Mobil Corporation is a leading company in the integrated oil and gas industry. Based out of Irving, Texas, the company produces crude oil and natural gas in North America, South America, Europe, Asia, and Australia. Exxon and Mobil were both large independent oil companies that underwent an \$81 billion merger in 1999.³² Both companies were descendents of the Standard Oil Company, which was established by John D. Rockefeller and partners in 1870.

By 1882 Rockefeller and his partners had purchased and acquired almost forty companies in the oil industry, and they consolidated the companies by merging them into the Standard Oil Trust. Later that year, the Trust formed two companies the Standard Oil Company of New York and the Standard Oil Company of New Jersey. The Standard Oil Company of New York would later become Mobil, and the Standard Oil Company of New Jersey would later become Exxon. By 1889 exploration, production, refining, transportation and marketing were all aspects of the petroleum industry for which the Standard Company Trust had become responsible.³³

Exxon Mobil trades on the New York Stock Exchange under the ticker symbol XOM. On October 1, 1928 the Standard Oil Company of New Jersey, the former name of the Exxon Corporation, was added to the Dow Jones Industrial Average. Mobil experienced four 2-for-1 stock splits: in 1966, 1979, 1981 and 1997. The Exxon Mobil Corporation also experienced a 2-for-1 stock split on June 20, 2001.³⁴

4.3 McDonald's Corp (MCD)

McDonald's Corporation is one of the most widely recognized fast-food restaurants. It was founded in 1940. The company operates and franchises locations across the globe, including the United States, Canada, Latin America, Europe and Asia. As of December 31, 2015, the company operated 36,525 restaurants.³⁵ McDonald's has led the fast-food industry for years. In 1985 the company was added to the Dow Jones Industrial Average, a true demonstration of its value and influence.

McDonald's Corporation trades in the NYSE. The company went public on January 1, 1965 offering its stocks at \$22.00 dollars each. By the end of the opening day those stocks had increased to \$30.00 and then \$49.00 shortly after.³⁶ Since McDonald's IPO in 1965 the company

has carried out twelve stock splits between the years of 1966-1999. A majority of these splits are 2-for-1 types or 3-for-2 with the exception of a 2% stock dividend in March of 1967.³⁷ The growing industrialization of fast food yielded many competitors for McDonald's Corp and the company relies heavily on capital to expand in the market. As of September 2015, McDonald's has experienced an annual revenue growth rate of roughly 7.4%.³⁶

4.4 NIKE, Inc. (NKE)

NIKE, Inc. is a leading company in the textile industry. It was founded in 1964 in Beaverton, Oregon under the name Blue Ribbon Sports, Inc. The company changed its name to NIKE, Inc. in 1971. NIKE, Inc. is responsible for designing, developing, marketing and selling athletic footwear, apparel, equipment and accessories for men, women, and children. Their products are sold worldwide. NIKE also brands college and professional team apparel and uniforms, which helps their notoriety. In addition to the NIKE trademark, they company also owns the trademarks for Converse, Chuck Taylor, All Star, One Star, Star Chevron, Jack Purcell, and Hurley.³⁸

NIKE trades on the New York Stock Exchange. On December 2, 1980 Nike went public with an initial public offering of 2,377,000 shares at \$11.50 each. A year after their IPO, NIKE inaugurated NIKE International Ltd to push the company into international markets. The revenue that was generated from stock sales fueled NIKE's expansion endeavors. Despite what seemed like national support of the company NIKE stock dipped until 1985 when the company signed basketball player, Michael Jordan and revamped the air shoe technology.³⁹

The Air Jordan and other models of the air shoe re-launched NIKE's market and encouraged the company to produce other models of athletic gear. Aggressive marketing

strategies and endorsement of popular athletes and athletic teams has proved beneficial to the growth of NIKE. Since its IPO Nike has split six times: in 1990, 1995, 1996, 2007, 2002, and 2015.³⁹

4.5 General Electric Company (GE)

General Electric Company was founded in 1892. It specializes in the diversified machinery industry. The company is continuously expanding its products and services. The company produces gas and steam powered systems. They are also one of the leading companies in the renewable energy field where they manufacture wind turbines and products to the hydropower industry. Their oil and gas segment of operations produce equipment used in land and sea drilling. The company has an aviation sector that produces commercial and military aircraft engines and systems. The company also has biopharmaceutical, home appliance and lighting solutions.⁴⁰

Historically, GE has been a public company since its conception in 1892 where it offered shares at \$102 a piece. General Electric is one of the original twelve companies listed on the Dow Jones Industrial Average in 1896. To this day it is one of the only original companies to remain on the Dow.⁴¹ Since its IPO, the General Electric Company has split its stock six times, all of which have been 2-for-1 splits with the exception of a 3-for-1 split in May 2002.⁴²

4.6 Smith and Wesson Holdings Corp (SWHC)

The Smith and Wesson Holdings Corporation manufactures and sells firearms. The company is composed of two segments: firearms and accessories. The company produces handguns and long guns. The accessories segment of the company manufactures products such

as gleaning supplies, gunsmithing tools, ear protection and vault accessories. In addition, the company also produces products used by law enforcement officials such as handcuffs. One of their most popular series of firearms are the Military & Police line, which are marketed as service weapons for military and police personal.⁴³

The Smith and Wesson Holdings Corp trades on the NASDAQ Stock Market. The company went public on May 11, 2001. The company began to push marketing as an authentic American brand and saw revenue increase. Historically the increases and decreases of SWHC have been greatly affected by occurrences in national news. In the past eight years, Smith and Wesson Holdings Corporation has experienced dramatic increases after threats of increased gun control following national gun violence.⁴⁴

4.7 Apple Inc. (AAPL)

Apple Inc, founded in 1977, is a leader in the electronic equipment industry. The company designs, manufactures and markets a variety of electronics. Their products can be found in homes, small and mid-sized business, educational facilities, and government facilities. The company is most notable for their products the iPhone, iPad and Mac brand of computers. The company also sells software, services and accessories. The company sells products through their website, retail stores, and third-party retailers. They also sell content through their iTunes store, App Stores, iBooks, and Mac App Store.⁴⁵

Apple Inc trades on the NASDAQ Stock Market. Apple went public in December of 1980 and sold 4.6 million shares at \$22.00 for its Initial Public Offering (IPO). By the end of the first day the shares increased 32% to \$29.00 dollars a share, a mere taste of the upward trends Apple stocks will experience over the next three decades.⁴⁶

Since 1980 the stock has split four times: in 1987, 2000, 2005, and 2014.⁴⁶ The first AAPL split was on June 15, 1987 when the stock price was \$78.50 a share. This was a historic high for Apple as a share was only \$18 two years prior after Steve Jobs was ousted for attempting to push out CEO, John Sculley. Apple experienced many ups and downs between 1987 and 2000 when the stock was split for the second time. Steve Jobs had taken on the title of CEO during Apple's path to near bankruptcy in 1997 and turned the company around with the introduction of the iMac. The iMac and the Internet boom revived Apple and by June of 2000 the stock price had reached \$101 and the second 2-for-1 stock split occurred. After the introduction of the iPod and the iTunes music store in 2001 Apple was leading the market and split the stock a third time in 2005. The next nine years would yield multiple new creations, such as the iPhone and iPad, from Apple and generate billions of dollars in profit. The company stole the title of world's most valuable company from Exxon Mobil Corp (NYSE:XOM) in August of 2013 with stock prices reaching an incredible \$456.68 a share. By June of 2014 Apple had exploded with shares at upwards of \$645 a share and split their stock 7-1.⁴⁷

The last three decades has shown the world just how valuable Apple is as a company. Many people suggest that the company will continue to lead the market with new and innovative technology. Most recently, Apple has released wearable technology with its introduction of the Apple Watch. Stocks of Apple Inc. are currently trading near their 52-week low. Their current ratio is 1.1-to-1. Apple's gross profit was 64.3 billion dollars in 2013, increased to 70.5 billion dollars in 2014, and was 93.6 billion dollars last year.

4.8 Alphabet Inc. (GOOG)

Alphabet Incorporated was established in 2015. The creation of Alphabet was the effort of the popular Internet search engine, Google, so that they could pursue additional business ventures such as hardware products. Google started as a privately owned company in 1998. The main service the company offered was functioning as a search engine. The company also offers advertising and productivity applications. Gmail, Google Docs, Google Maps, and YouTube are all widely known and used applications subsidiaries under the Alphabet Inc. ⁴⁸

On August 19, 2004 Google's initial public offering took place by offering 19,605,052 shares at a price of \$85 per share. ⁴⁹ At 9:45 a.m. on February 2, 2016, Alphabet's market capitalization was \$547.1 billion, making it surpass Apple to become the world's most valuable public company. ⁵⁰ Google and Apple were neck and neck between 2008 and 2010, where their market capital values reversed multiple times. Google attracts investors because its applications continue to lead the industry. The company generates revenues primarily from its digital advertising services, and their services are comparatively inexpensive to provide, which lets the company invest in research into new endeavors. ⁵⁰ Google first introduced the idea of a stock split in 2012, but the company experienced its first and only split on March 27, 2014. ⁵¹ Over the past three years, Alphabet's profits have increased from 33.5 to 40.6 to 46.8 billion respectively.

4.9 Nintendo Co. Ltd. (NTDOY)

Nintendo Company Limited is a Japanese based company founded in 1889. Its headquarters is located in Kyoto, Japan. The company was originally founded under the name Nintendo Playing Card Company Limited and changed to their current name in 1963. The company manufactures and sells videogame consoles and software. In addition, the company

also develops their products, and they own the rights to many famous videogame characters and titles. Their games, consoles and playing cards are available internationally in North America, Europe, Australia and Asia.⁵²

Chapter 5 – Simulation

5.1 Simulation Week 1

5.1.1 Introduction to Simulation

As aforementioned, the stock market has an average annual return on its investments of 10.5 percent, which gives it the largest return out of all of the investment methods.¹⁰ However, it is important to remember that this is an average. One must acknowledge that there are stock market investors that lose money on their investments, and there are rare investors that earn much larger returns on their investments.

The goal of this project was to create a portfolio that ultimately earned a larger return on its investments than if the money was invested into an alternative investment vehicle. For the purpose of this simulation, the portfolio of five-hundred thousand dollars was required to be split between five to seven companies at all times. The capital invested could be split among the companies in any way desirable. It was decided that trades would be conducted through a discount broker. After research into the commission rates charged by discount brokers and their required deposits, the simulation used the commission rate charged by Firstrade.com, \$6.95 per trade. The commission rate data collected from five leading discount broker sites can be found below in Table 1.

	FRISTRAD	TD AMERITRADE	ETRADE	FIDELITY	SCHWAB
Online Stock Orders	\$6.95/trade	\$9.99/trade	\$9.99/trade	\$7.95/trade	\$8.95/trade
Minimum Initial Deposit	\$0	\$0	\$500	\$2,500	\$1,000

Table 1 - Broker Comparison

The simulation started by purchasing stocks in five companies at their open price on Monday, June 6, 2016. Before the start of the seven-week simulation, research was conducted on several different methods used by investors to influence their trades. Those examples can be found above in Chapter 3. This simulation did not limit the methods that were used to buy or sell shares of a company, because experts suggest that professional traders use a wide variety of methods in their analysis. In addition to trading methods, the simulation did not limit to which exchanges stocks belonged.

The simulation used the Yahoo! Finance website to research the companies involved with the simulation and track the portfolio. The Yahoo.com website allows users to search for any company or ticker symbol being traded on all exchanges, including over-the-counter exchanges. They also provide many interactive graphs that proved to be useful for this simulation. The screenshots included in this report were obtained from the Yahoo.com website unless otherwise noted. The website also provides a free signup so that users can create an account and track their personal portfolios. Users signed up for their services can access their portfolios using computers or an application on their mobile phones to see live data, charts and performance.

5.1.2 Week 1 Trades

For the initial portfolio purchases, five companies were chosen based on familiarity with their names and strong historical trends. It was desired to choose companies each from a different industry to see which industries were outperforming others. Each company was allotted \$100,000 worth of capital for investment and the number of shares was determined by dividing the investment by the company's opening price on Monday, June 6, 2016, rounding down to the nearest whole number. Five commission charges of six dollars and ninety-five cents were also withdrawn from the bank. Each commission charge was included in the "Net Cost/Proceeds" column. The total division of the portfolio can be seen below in Table 2 – Simulation Week 1 Trades. To gain a familiarity with how the market was trading, the five companies were held for the entire week.

Date	Symbol	Buy/ Sell	Price	Shares	Net Cost/ Proceeds	Profit/ Loss	Total Cash	Total Profit
6/1/16							\$500,000.00	
6/6/16	SAM	Buy	\$155.25	644	\$99,987.95		\$400,012.05	
6/6/16	XOM	Buy	\$88.87	1125	\$99,985.70		\$300,026.35	
6/6/16	MCD	Buy	\$121.79	821	\$99,996.54		\$200,029.81	
6/6/16	NKE	Buy	\$52.76	1895	\$99,987.15		\$100,042.66	
6/6/16	GE	Buy	\$30.00	3333	\$99,996.95		\$45.71	

Table 2 - Simulation Week 1 Trades

Research was conducted on the financial statements and stock price trends of the Boston Brewing Company. Boston Brewing Company owns the Sam Adams name, which is a popular beer in the New England region. The company does several promotions in the area and sponsors several events. For example, Sam Adams is one of the sponsors of the Boston Marathon, and

even has a special flavor titled “26.2” which is only available at bars along the route of marathon. The stock follows the CAN SLIM model and had a current ratio of 2-to-1. Analysts will generally agree that a current ratio should be at least 2-to-1. The company’s profits are continually increasing year to year, which is one of the indicators of the CAN SLIM model as a stock worth investing in. The stock was also trading at the lower end of its 52-week range suggesting that it had potential to be a value stock. Institutional and mutual fund owners own eighty-one percent of its shares. Other factors considered were an earnings per share of \$6.82 and a P/E ratio of 23.27. The Boston Beer Company does not pay dividends. The trading price over the past four years can be seen in Figure 2.



Figure 2 - (NYSE: SAM) Price Trend From June 4, 2012 to June 3, 2016

Exxon Mobil Corporation has been one of the leaders in the oil and gas industry since its incorporation. It is nearly impossible to avoid their name in one’s day-to-day life, whether it is in travel or in the news. Exxon Mobile is one of the thirty companies tracked for the Dow Jones Industrial Average. The Exxon Mobil Corporation had unfortunately reported slowly decreasing profits on its last three income statements, on December 31st in 2013, 2014 and 2015. Although

the company has reported decreasing profits, many professionals have seen Exxon Mobil as a growth stock for long-term investments. The company was trading at the higher end of its 52-week range. As seen in the four-year price trend shown below in Figure 3, historically the price of the Exxon Mobile stock will increase during the time frame of this project, so this stock was purchased in hopes that this seasonal-trend would continue. Institutional and Mutual Fund Owners hold fifty percent of the company's shares. Exxon Mobil's last reported dividend was \$3.00, and it had an earnings per share of \$2.52 and a P/E ratio of 35.27.



Figure 3 - (NYSE: XOM) Price Trend From June 4, 2012 to June 3, 2016

McDonald's Corporation was trading near its highest price in its history. Figure 4 on the following page shows the price trend of McDonald's from June 04, 2012 to June 03, 2016. According to their income statements, McDonald's profits have been steadily decreasing since 2013. However, their current ratio was 3.2-to-1. McDonald's Corporation is part of the Dow Jones Industrial Average, which means that its performance is critical for analyzing the health of the market. The company is still leading the fast food industry, and it was the hope that the investment into this company would be a growth investment. McDonald's institutional

ownership was 69.30 percent and their last annual dividend was \$3.56. The company's P/E ratio was 23.24 and its earnings per share was \$5.24.

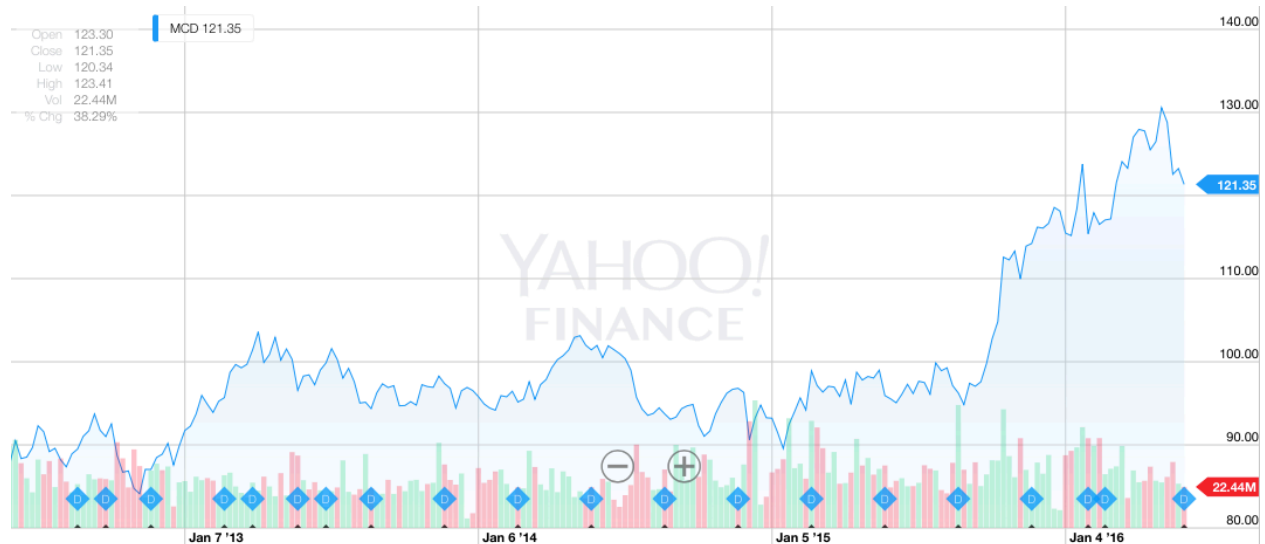


Figure 4 - (NYSE: MCD) Price Trend From June 4, 2012 to June 3, 2016

NIKE, Inc. is another one of the companies that is part of the Dow Jones Industrial Average. The company's stock price saw an all time high in December 2015. This was also when the company split for its seventh 2-for-1 split in its history.²⁸ In the interest of this simulation portfolio, NIKE stock was purchased because of their strong performance over the course of the company's history. The stock was trading towards the lower end of its' 52-week range. The Relative Strength Index was also suggesting that it was a good buy. Eighty-four percent of the company's stocks were owned by institutional and mutual fund owners meaning that professional investors believed NIKE stock was a desirable stock. The company's current ratio was 2.5-to-1. Their profits have increased from 11 billion to 12.4 billion, to 14 billion over the last three years. NIKE's earnings per share was \$2.16, making their price/earnings ratio 24.43. NIKE reported its last dividend as sixty-four cents. Figure 5 on the following page shows the four-year price trend with the RSI for NIKE stock.

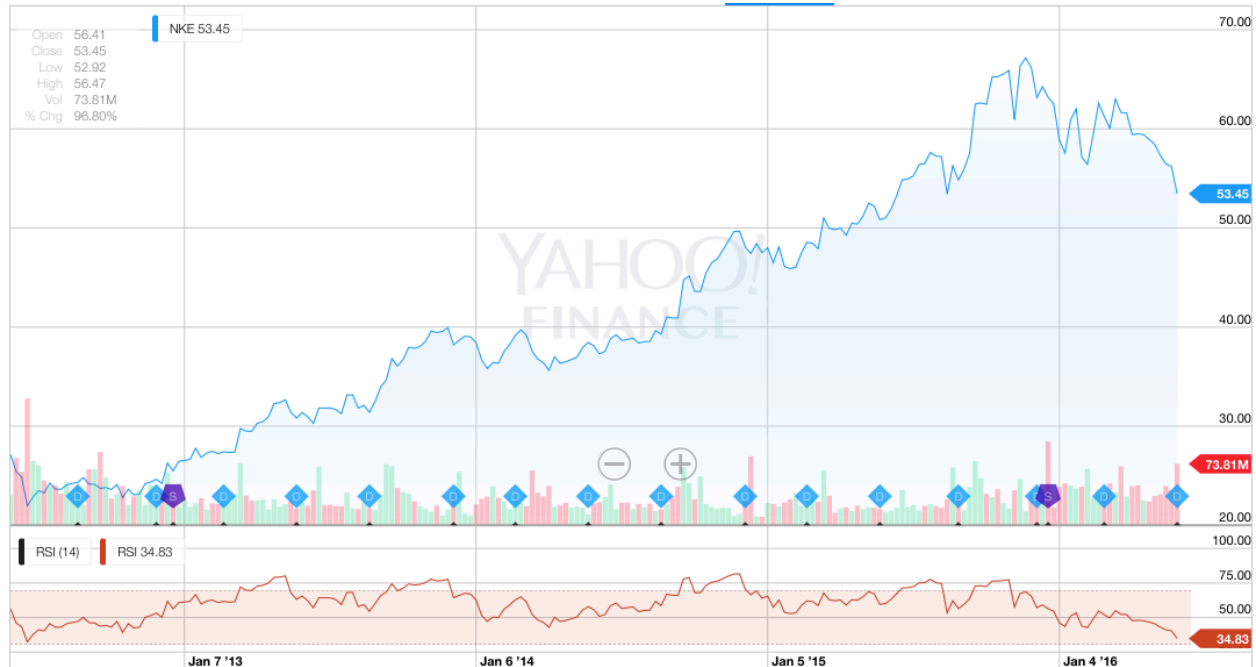


Figure 5 - (NYSE: NKE) Price Trend and RSI From June 4, 2012 to June 3, 2016

The last of the five stocks purchased for the initial simulation portfolio was the General Electric Company. GE was chosen because of the company's powerful name in the diversified machinery industry. Institutional ownership accounted for 57 percent of GE's stock ownership. General Electric's pays dividend of ninety-two cents a share, a 3.01 percent yield. Its earnings per share was seventy-four cents and its P/E ratio was 40.54. GE's current ratio was 1.1-to-1. The company's stock saw an all time high at \$60.50 a share in July 2000. The stock experienced a harsh decline until 2002, and slowly climbed back up until July 2007. It then experienced a second harsh decline until 2009. The stock price had slight turbulence since 2009, but slowly climbed back up since then. Figure 6 on the following page shows the company's price trend over the last 4 years.

The General Electric Company trades on the New York Stock Exchange. Its stocks were trading near the high end of its 52-week range. The stock price, however, was higher than its year-to-date price, and the stock price had been creeping up over the past 5 years. It was the hope

that this stock would be another growth stock. The company's profits remained the same over the past three years; they were 30.7, 30.9, and 32 billion dollars respectively.



Figure 6 - (NYSE: GE) Price Trend From June 4, 2012 to June 3, 2016

5.2 Simulation Week 2

The second week of the simulation fell from June 13, 2016 through June 19, 2016. Four out of five of the companies in the portfolio experienced an increase in price. General Electric Company's stock experienced a slight decrease in price. The price had fallen two cents a share, but the portfolio owned three thousand, thirty-three shares, which made the portfolio experience a total loss of \$66.66.

Using news following, an event occurred on the last day of the simulation's first week, which indicated the potential of a trade. All major news stations were reporting a tragedy. In the early hours of the morning on June 12, 2016, an Orlando, Florida nightclub had experienced a mass shooting. Forty-nine people were murdered and fifty-three wounded by a terrorist using both a rifle and a handgun.⁵³ The following day—Monday, June 13, 2016—Politicians started proposing bans on certain types of rifles and increased background checks prior to civilian gun purchases. News and trends suggest that firearm sales and stocks in firearm manufacturing companies spike after tragedies and gun-control debate.⁴⁴

Based on the Orlando shooting and firearm sale trends, it was decided that the investment that was previously in the General Electric Company would be used to purchase shares of the Smith and Wesson Holdings Corporation. Shares of this stock were trading in the middle of its 52-week range. The price of the stock was significantly higher than its year-to-date price. The company's current ratio was 2.7-to-1. Between 2013 and 2014, Smith and Wesson Holdings Corporation's profits dropped, but then increased above their 2013 reporting to 293.8 million dollars in 2015. SWHC does not pay dividends. The company's earnings per share was \$1.68, making its P/E ratio 13.93. Smith and Wesson was chosen for the portfolio as a value stock. Figure 7 on following page shows the price history for the company's stock over the last four

years. The trades made during the second week of the simulation can be found following Figure 7 in Table 3.



Figure 7 - (NASDAQ: SWHC) Price Trend From June 14, 2012 to June 13, 2016

Date	Symbol	Buy/ Sell	Price	Shares	Net Cost/ Proceeds	Profit/ Loss	Total Cash	Total Profit
6/6/16							\$45.71	
6/13/16	GE	Sell	\$29.98	3333	\$99,916.39	\$66.66	\$99,976.00	\$66.66
6/13/16	SWHC	Buy	\$23.40	4270	\$99,924.95		\$51.05	

Table 3 - Simulation Week 2 Trades

5.3 Simulation Week 3

On Tuesday June 21, 2016, the next trade for the portfolio became apparent. The McDonald's Corporation was not performing as well as the other four companies. It was experiencing a lot of price volatility, which can be seen below in Figure 8. However, it was still trading at a price higher than for which it was purchased. It was decided that since selling any shares of McDonald's would turn a profit on those shares, that the dollar amount of the investment should be cut by almost half. This portion of the portfolio could be invested into a company that was earning more per share. Table 4, located at the end of this section, records the trades for Week 3. As can be seen in Table 4, four-hundred shares of the eight-hundred and twenty-one shares owned of McDonald's were sold at \$122.69, a 0.7% return on the investment. This trade generated \$360 dollars of profit. When this profit was added to the loss that was associated with Simulation Week 2, the portfolio was then ahead by \$293.34.



Figure 8 - (NYSE: MCD) Price Trend From June 6, 2016 to June 21, 2016

The portfolio's bank jumped to \$49,120.10 after the sale of 400 shares of McDonald's Corporation. Over the course of its first six trading days, the portion of the portfolio dedicated to Smith and Wesson Holdings Corporation stock had experienced a 3.9% increase in price, making it the top performing holding to date during the simulation. This can be seen below in Figure 9. It was decided that the proceeds from the McDonald's Corporation sale would be used to invest back into Smith and Wesson Holdings Corporation stock, thus purchasing an additional 2018 shares.



Figure 9 - (NASDAQ: SWHC) Price Trend From June 13, 2016 to June 21, 2016

When the portfolio was assessed on Friday, June 24, 2016, it was determined that the Exxon Mobil Corporation was not performing as well as the other four companies in the portfolio. The price trend over the first fifteen days of trading can be seen on the following page in Figure 10. The investment had generated a 1.4% profit, and while the stock price was slightly higher than the purchase price, it was seen as an opportunity to sell and use the proceeds to

purchase a new company that could generate higher profits. The sale of the Exxon Mobil investment generated \$1,383.75 of profit. The portfolio was now a total of \$1,677.09 ahead.



Figure 10 - (NYSE: XOM) Price Trend From June 6, 2016 to June 24, 2016

Figure 11 on the following page shows the price trend for Apple, Inc. over the last four years. The stock was trading towards the lower end of its 52-week range. Figure 10 also shows that the Relative Strength Index for the Apple, Inc. stock was approaching the undersold side, which indicates a buy. Although their current ratio was on the lower side, valued at 1.1-to-1, the company reported increasing profits the last three years. Apple's last annual dividend was \$2.28. The company's earnings per share was \$8.98, making its P/E ratio 10.41. The proceeds generated from the sale of the Exxon Mobil stock were used to purchase 1083 shares of Apple, Inc.

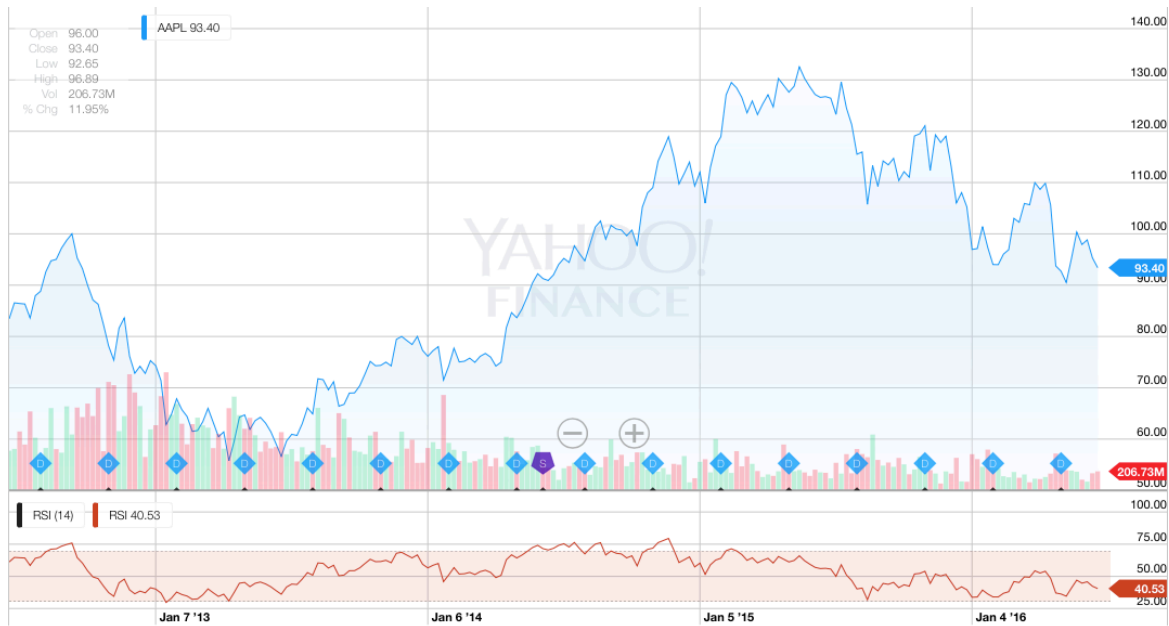


Figure 11 - (NASDAQ: APPL) Price Trend and RSI From June 25, 2012 to June 24, 2016

Date	Symbol	Buy/ Sell	Price	Shares	Net Cost/ Proceeds	Profit/ Loss	Total Cash	Total Profit
6/13/16							\$51.05	
6/21/16	MCD	Sell	\$122.69	400	\$49,069.05	\$360	\$49,120.10	\$293.34
6/21/16	SWHC	Buy	\$24.31	2018	\$49,064.53		\$55.57	
6/24/16	XOM	Sell	\$90.10	1125	\$101,355.55	\$1,383.75	\$101,418.07	\$1677.09
6/24/16	APPL	Buy	\$93.52	1083	\$101,289.11		128.96	

Table 4 - Simulation Week 3 Trades

5.4 Simulation Week 4

Over the weekend, the stock price of McDonald's Corporation fell below the purchase price. It was determined that rather than holding onto the stock in hopes of a rebound, the remaining investment would be sold at a loss. Selling the remaining shares at a loss of \$3.63 per share caused the portfolio to experience a loss of \$1,528.23, a 3.0 percent loss. The portfolio was still \$148.86 ahead for the entire simulation to date. The trade data can for week four can be found in Table 5 on the next page at the end of this section.

The Alphabet Incorporated (NASDAQ: GOOG) had been being watched until this date. As seen on the next page, in Figure 12, the price of Alphabet Inc. had fallen below the fifty-day simple moving average, which indicated a buy. It was decided that the proceeds generated from the sale of the McDonald's Corporation would be invested into 74 shares of Alphabet. Alphabet was trading towards the middle of its 52-week range. It was chosen because it has a strong trading history, and it was hoped this pattern would continue. Seventy-three percent of the company's shares are owned by institutional and mutual funds. The company's current ratio was 5.1-to-1. Alphabet does not pay dividends. The earnings per share was \$25.84, making the P/E ratio 25.96.



Figure 12 - (NASDAQ: GOOG) Price Trend and SMA From June 28, 2012 to June 27, 2016

Date	Symbol	Buy/ Sell	Price	Shares	Net Cost/ Proceeds	Profit/ Loss	Total Cash	Total Profit
							128.96	
6/27/16	MCD	Sell	\$118.16	421	\$49,738.41	\$1,528.23	\$49,867.37	\$148.86
6/27/16	GOOG	Buy	\$671.00	74	\$49,660.95		\$206.42	

Table 5 - Simulation Week 4 Trades

5.5 Simulation Week 5

The fifth week of the simulation was a short trading week because Monday, July 4th was a holiday and the exchanges were closed. The portfolio's stocks were all performing well during this week of the simulation, so it was hard to justify many trades. The evening of July 7th, 2016, national news broke with a story from Dallas. A sniper at a protest, which had started as a peaceful protest, shot twelve police officers. The result of the shooting was five fatalities. ⁵⁴

Historically, shares of gun makers experience a surge the week after the shooting, and the trend starts to decline after a month.⁵⁵ Due to the largest portion of the portfolio being dedicated to Smith and Wesson Holdings Corporation, news articles and analysts opinion pieces on the defense industry were being closely watched. The relative strength index indicated a sell starting on July 7th, even before news of the shooting. The morning after the shooting the trend continued and the relative strength index pushed higher, as seen below in Figure 13, and it was decided that the additional shares of Smith and Wesson purchased during the third week of the simulation would be sold. This investment generated \$10,964.02 for the portfolio, a 22.3% profit. Figure 13 was generated using the NASDAQ website because the Yahoo! Finance website was unable to produce the graph.

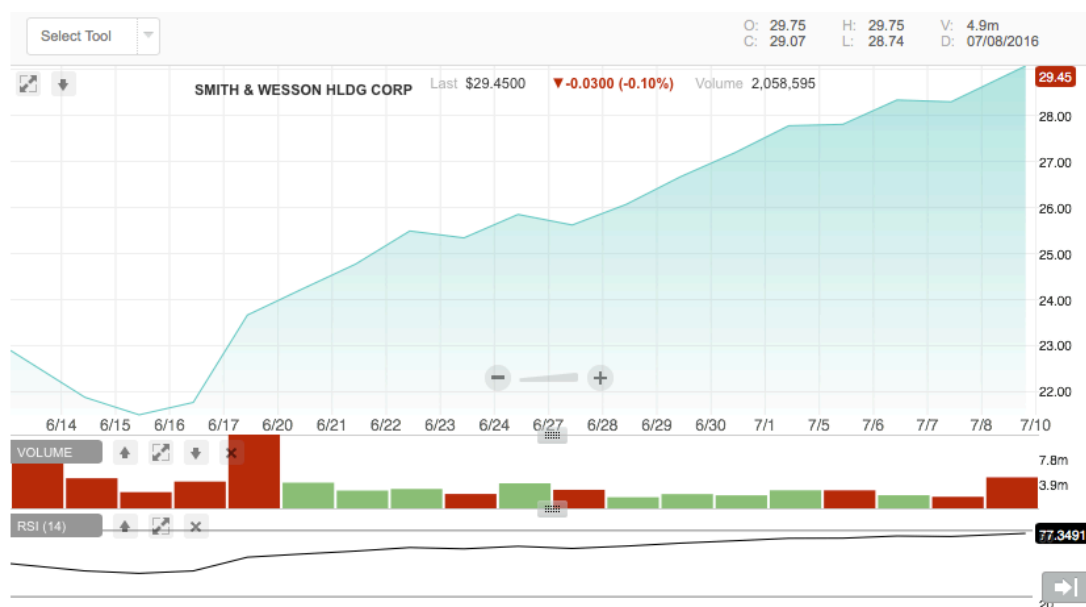


Figure 13 - (NASDAQ: SWHC) RSI and Price Trend From June 13 to July 8

Date	Symbol	Buy/ Sell	Price	Shares	Net Cost/ Proceeds	Profit/ Loss	Total Cash	Total Profit
							\$206.42	
7/8/16	SWHC	Sell	\$29.75	2018	\$60,028.55	\$10,964.02	\$60,234.97	\$11,112.88
7/8/16	GOOG	Buy	\$699.50	86	\$60,163.95		\$71.02	

Table 6 - Simulation Week 5 Trades

5.6 Simulation Week 6

During the sixth week of the simulation, the market was performing at record highs. Tuesday, July 12, the Dow Jones industrial average closed 24 points higher than the day before, marking a four-day winning streak, and beating out its previous record from 2009.⁵⁶ The S&P 500 also closed at its record high Tuesday. Both indexes continued to gain over the week until they hit their new highs on Friday, July 15.⁵⁷ The NASDAQ index was also approaching its previous record. Based on the fact that the indexes were reaching record territory, during the week assessments of the portfolio, stocks that were going against the trend were looked for. Smith and Wesson started to fall, and because the Relative Strength Index suggested selling at the close of Week 5, it was decided that another portion of the SWHC stock would be sold on Tuesday.

On July 6, a new cell phone application was released. Analysts were reporting the new game, Pokemon Go, was responsible for driving the stock price of both Google and Nintendo Company Limited, (OTC: NTDOY).⁵⁸ Nintendo trades on the Tokyo Stock Exchange. Figure 14 on the following page shows the price trend for Nintendo over the past four years. The

company's last reported earnings per share was \$0.17 in the red, meaning they reported a loss last quarter. However, the company did pay an eighteen-cent dividend. The company was trading near the high of its 52-week range. Despite its poor EPS, it was decided that the proceeds from Smith & Wesson would be invested in Nintendo based on the news coverage of the Pokemon Go app.



Figure 14 - (OTC: NTDOY) Price Trend From July 13, 2012 to July 12, 2016

The Boston Beer Company was also trending in the opposite direction of the major indexes. The decline in the SAM ticker can be seen in Figure 15 on the following page. As of July 13, the investment in the Boston Beer Company had returned 9.4 percent. It was decided that because of its positive direction until this week, only half of the stocks would be sold, as of this date.



Figure 15 - (NYSE: SAM) Price Trend From June 6 to July 13

The initial five companies that the portfolio invested in had been continuously monitored because they were important for the buy and hold comparison in the results. It had been noticed that after the stocks in the General Electric Company had been sold at a loss, the company had made a comeback. The market experienced a decline the week of June 27 through July 1. This trend can be seen in GE's price trend graph seen on the following page in Figure 16. After that week, the market bounced back and GE also experienced this trend. It was decided that the proceeds from the Boston Beer Company sale would be invested in General Electric. This trade as well as the other trades for week six can be found on the following page at the end of this section.

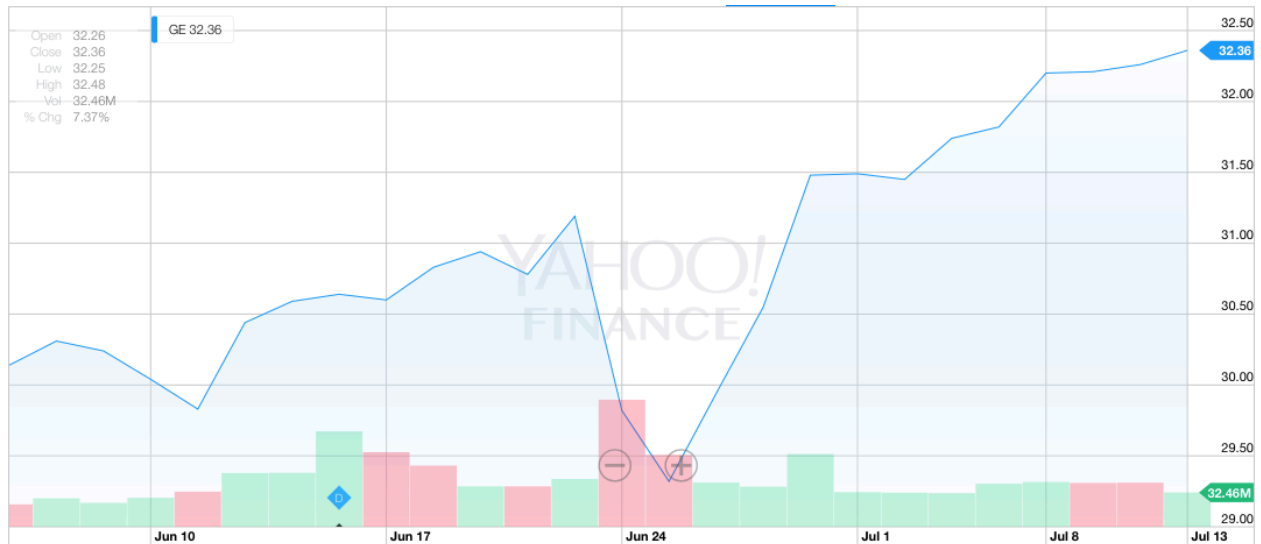


Figure 16 - (NYSE: GE) Price Trend from June 6 to July 13

Date	Symbol	Buy/ Sell	Price	Shares	Net Cost/ Proceeds	Profit/ Loss	Total Cash	Total Profit
							\$50.17	
7/12/16	SWHC	Sell	\$28.50	2000	\$56,993.05	\$10,186.10	\$57,043.22	\$21,243.38
7/12/16	NTDOY	Buy	\$27.59	2065	\$56,980.30		\$62.92	
7/13/16	SAM	Sell	\$169.91	322	\$54,704.07	\$4,706.62	\$54,766.99	\$25,950.00
7/13/16	GE	Buy	\$32.26	1695	\$54,687.65		\$79.34	

Table 7 - Simulation Week 6 Trades

5.7 Simulation Week 7

On July 18, 2016, the last day of simulation week six, the Dow Jones Industrial Average closed at record highs for the fourth consecutive session.⁵⁹ As the simulation was coming to an end, any trades during the seventh—and final—week of the simulation were made by searching for companies that were following this trend. The DJIA continued setting record highs until July 20th where it closed at \$18,525.03. Smith and Wesson approached its 52-week high on July 8th, and two thousand and eighteen of the portfolio's shares were sold. It was hoped that the company's upward momentum would continue, and it did for another session but began to drop after that. With all of the major indexes approaching and reaching their record highs, it was decided that since Smith and Wesson was no longer on the forward momentum the remaining shares would be liquidated. These shares generated an additional \$12,153.30 profit for the portfolio. The price trend for the SWHC ticker symbol from the original purchase until the July 18th, the date of the last SWHC trade, can be seen below in Figure 17.



Figure 17 - (NASDAQ: SWHC) Price Trend From June 13 to July 18

McDonald's, which was one of the original purchases for the portfolio, had been gaining momentum from its previous loss. It had been following the same upward trend that the DJIA had been experiencing. This trend can be seen below in Figure 18, which shows the price trend of McDonald's Corporation from the start of the simulation until July 18th. As of July 18th, the portfolio had generated \$38,103.30 of profit, so it was decided that this profit would be invested back into McDonald's to see if the company could continue on its upward trend following the Dow.

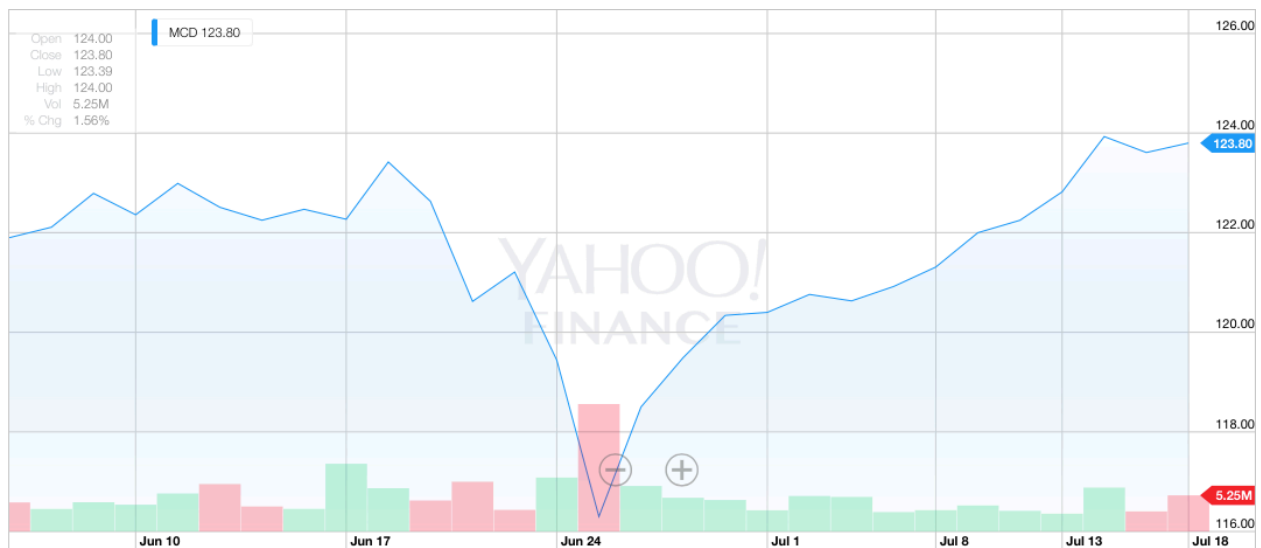


Figure 18 - (NYSE: MCD) Price Trend June 6 to July 18

As aforementioned, the Dow continued its record-breaking streak until July 20th. It was therefore important to look for any companies in the portfolio that were losing momentum. Figure 19 on the following page shows the price trend for NIKE during the entire length of the simulation. Similar to Smith and Wesson, NIKE started to drop at the end of week six in contrast to the Dow continuing its upward trend. It was decided that all shares of NIKE would be sold on July 19th in hopes that the capital would generate a larger profit in a different company. The

NIKE shares were sold for \$57.46 each. For the portfolio, this meant the NIKE investment had a return of 8.9 percent and it generated an \$8,892.60 profit. To date, the portfolio had generated a total profit of \$46,995.90.



Figure 19 - (NYSE: NKE) Price Trend From June 6 to July 19, 2016

Alphabet Incorporated had been performing extremely well for the entire duration of the simulation. The company's price trend from the date of the first purchase of its stock can be seen in Figure 20 on the following page. The Yahoo! Finance website was having difficulties producing the graph for the parameter dates, so Figure 20 was generated using the NASDAQ website. Based on its strong performance, it was desired to purchase as much stock in this company as the portfolio could afford. However, it was challenging because the price for one stock was almost five times the cost of the portfolio's next highest costing stock. Using the proceeds from NIKE, an additional 186 shares of GOOG were purchased. This brought the total number of GOOG shares owned to 346 shares.



Figure 20 - (NASDAQ: GOOG) Price Trend From June 27 to July 19

Figure 21 on the following page shows the performance of the Nintendo Company from when its stocks were purchased on July 12th until July 20th. Figure 14 from section 5.6 on the sixth week of the simulation showed the stock jumping approximately ten dollars in value around the time of the release of the new mobile phone game, Pokemon Go. The stock was purchased for \$27.59 a share on July 12th. As can be seen in Figure 21, the stock has remained relatively mobile and sold for over \$38 dollars during Week 7. The stock was watched over the first two sessions of Week 7, but it appeared that the stock had lost some momentum. Rather than holding the stock until the end of the trading day on Friday, it was decided to sell all NTDOY shares at \$33.89, which generated a \$12,995.60 profit. The return on the Nintendo investment was 22.8 percent, and the profit from the sale of Nintendo brought the profits generated by the portfolio to \$59,991.50.



Figure 21 - (OTC: NTDOY) Price Trend From July 12 to July 20

The sale of the Nintendo Corporation was the last trade of the simulation. The remaining holdings were sold at the close price on Friday, July 22, 2016. Table 8 on the following page shows all trades made during Week 7, along with the sales associated with liquidating the remainder of the portfolio.

Date	Symbol	Buy/ Sell	Price	Share	Net Cost/ Proceeds	Profit/ Loss	Total Cash	Total Profit
7/18/16	SWHC	Sell	\$28.76	2270	\$65,278.25	\$12,153.30	\$65,357.59	\$38,103.30
7/18/16	MCD	Buy	\$124.00	308	\$38,198.95		\$27,158.64	
7/19/16	NKE	Sell	\$57.46	1895	\$108,879.75	\$8,892.60	\$136,038.39	\$46,995.90
7/19/16	GOOG	Buy	\$729.89	186	\$135,766.49		\$271.90	
7/20/16	NTDOY	Sell	\$33.89	2065	\$69,975.90	\$12,995.60	\$70,247.80	\$59,991.50
7/22/16	SAM	Sell	\$190.16	322	\$61,224.57	\$11,227.12	\$131,472.37	\$71,218.62
7/22/16	APPL	Sell	\$98.66	1083	\$106,841.83	\$5,552.72	\$238,314.20	\$76,771.34
7/22/16	GOOG	Sell	\$742.74	346	\$256,981.09	\$11,389.70	\$495,295.29	\$88,161.04
7/22/16	GE	Sell	\$32.06	1695	\$54,334.75	(\$352.90)	\$549,630.04	\$87,808.14
7/22/16	MCD	Sell	\$128.26	308	\$39,497.13	\$1,298.18	\$589,127.17	\$89,106.32

Table 8 - Simulation Week 7 Trades

Chapter 6 – Conclusions

6.1 Results of the Simulation

The trades made with the initial five hundred thousand dollar investment generated an \$89,106.32 profit. The portfolio had a 17.8 percent return on the investment. As previously mentioned in this report, the average yearly return on stock investments is 10.5 percent. When that 10.5 percent is looked at for a seven-week period, it indicates that the average seven-week investment would have a return of 1.4 percent. Therefore, the portfolio's return of 17.8 percent is extremely high. In addition to the portfolio's stocks, the Dow Jones Industrial Average and the NASDAQ Composite indexes were tracked over the seven-week simulation. Their price trends can be seen on the following page in Figure 22 and Figure 23, respectively. The performance of the indexes set a benchmark for the health of the market. It can be seen that many stocks exhibited very similar price trends over the course of the simulation. The return on the Dow over the course of the seven-weeks was 3.5 percent. The return on the NASDAQ Composite was 2.6 percent. Over the seven weeks, both indexes outperformed the average return on stock investments, as well. However, they still did not perform nearly as well as the stocks chosen for the portfolio.

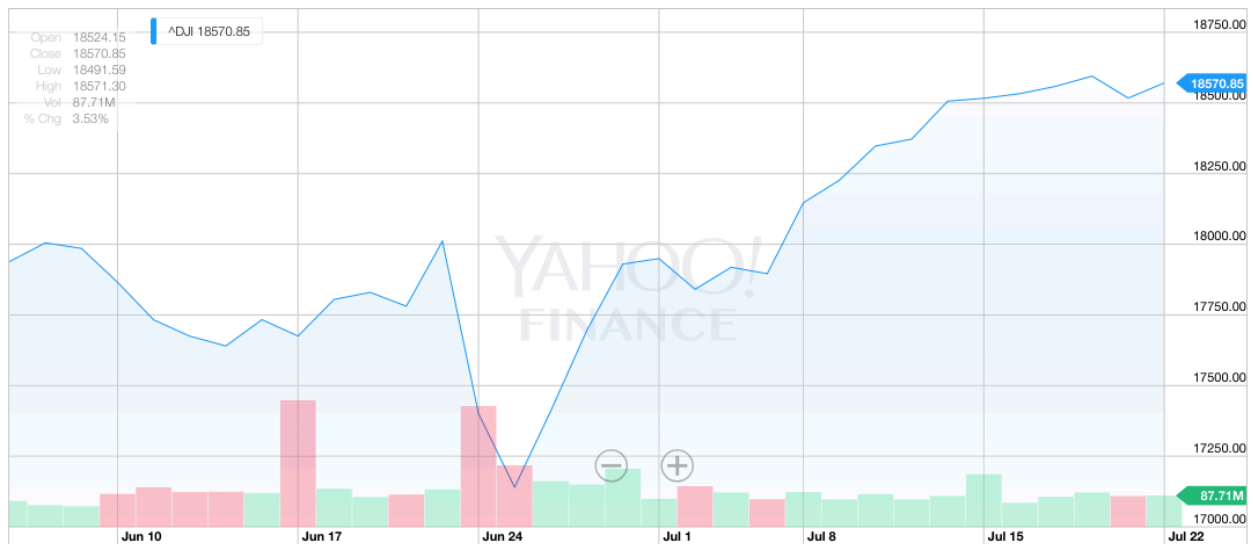


Figure 22 - (^DJI) Price Trend From June 6 to July 22



Figure 23 - (^IXIC) Price Trend From June 6 to July 22

6.2 Buy and Hold Strategy

As a comparison to how the simulation's portfolio performed, the five original stocks purchased were analyzed. The Boston Beer Company was the first stock purchased. The stock was purchased at opening price on June 6, 2016 for \$155.25. If the SAM stocks were held for the entire seven weeks, six hundred and sixty-six shares would have been sold at the closing price of \$190.16, on July 22, 2016. The investment in this company had a return of 22.5 percent, and the investment generated a \$22,482.04 profit. The performance of the Boston Beer Company over the seven-week simulation can be seen below in Figure 24.



Figure 24 - (NYSE: SAM) Price Trend from June 6 to June 22

The second company purchased for the portfolio was the Exxon Mobil Corporation. The stock was purchased at \$88.87 a share. The XOM ticker's performance over the course of the simulation can be seen on the following page in Figure 25. Exxon Mobil closed on July 22, 2016 at \$94.01 a share. Using the buy-and-hold strategy, the Exxon Mobil investment yielded a return

of 5.8 percent and a profit of \$5,782.50. The performance of Exxon Mobil over the seven-week simulation can be seen below in Figure 25.



Figure 25 - (NYSE: XOM) Price Trend From June 6 to July 22

Shares of McDonald's Corporation were the third purchase for the portfolio. On June 6, 2016, McDonald's opened at \$121.79. The performance of ticker symbol MCD over the seven-week simulation can be seen on the following page in Figure 26. At the close of the July 22, 2016 session of the New York Stock Exchange, shares of McDonald's were sold for \$128.26. The investment in McDonald's generated a \$5,311.87 profit, which was a return of 5.3 percent.

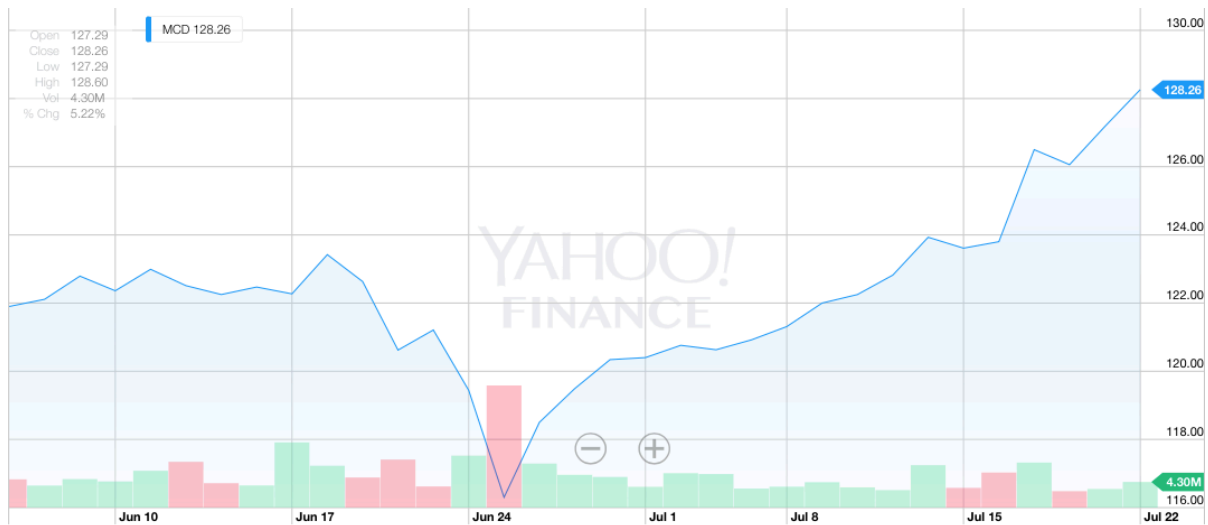


Figure 26 - (NYSE: MCD) Price Trend From June 6 to July 22

One thousand, eight hundred and ninety-five shares of NIKE were purchased on June 6th for the portfolio. Each share was purchased for \$52.76. The performance of NIKE over the duration of the simulation can be seen below in Figure 27. The closing price on July 22 for NIKE was \$56.73. The return on the NIKE investment was 7.5 percent and generated \$7,523.15 of profit.



Figure 27 - (NYSE: NKE) Price Trend From June 6 to July 22

The last holding of the initial portfolio was in stocks of the General Electric Company. Shares of GE were purchased at \$30.00 a piece at the open of the session on June 6th. The performance over the seven-week simulation can be seen in Figure 28. The General Electric Company closed on Friday, July 22, 2016 at \$32.06. The investment in GE had a return of 6.9 percent, and generated a \$6,865.98 profit. All buy-and-hold transactions can be seen on the following page in Table 9.



Figure 28 - (NYSE: GE) Price Trend From June 6 to July 22

Date	Symbol	Buy/ Sell	Price	Shares	Net Cost/ Proceeds	Profit/ Loss	Total Cash	Total Profit
6/1/16							\$500,000.00	
6/6/16	SAM	Buy	\$155.25	644	\$99,987.95		\$400,012.05	
6/6/16	XOM	Buy	\$88.87	1125	\$99,985.70		\$300,026.35	
6/6/16	MCD	Buy	\$121.79	821	\$99,996.54		\$200,029.81	
6/6/16	NKE	Buy	\$52.76	1895	\$99,987.15		\$100,042.66	
6/6/16	GE	Buy	\$30.00	3333	\$99,996.95		\$45.71	
7/22/16	SAM	Sell	\$190.16	644	\$122,456.09	\$22,482.04	\$122,501.80	\$22,482.04
7/22/16	XOM	Sell	\$94.01	1125	\$105,754.30	\$5,782.50	\$228,256.10	\$28,264.54
7/22/16	MCD	Sell	\$128.26	821	\$105,294.51	\$5,311.87	\$333,550.61	\$33,576.41
7/22/16	NKE	Sell	\$56.73	1895	\$107,496.40	\$7,523.15	\$441,047.01	\$41,099.56
7/22/16	GE	Sell	\$32.06	3333	\$106,849.03	\$6,865.98	\$547,896.04	\$47,965.54

Table 9 - Seven Week Buy and Hold Simulation

6.3 Final Conclusions

As previously mentioned, the stock market historically has been the investment vehicle with the largest return on one's investment. The goal of this project was to conduct a simulation in which first hand experience was gained using researched trading methods. In addition, the return on the simulation's portfolio was to be a larger percent than the return on the same investment in alternative investment vehicles.

The simulation's portfolio was maintained using the active trading method trend following. Primarily, news following was the trend trading method used. Both technical and fundamental analysis were performed on the companies traded. Other indicators that were examined when making trade decisions were the 50-day simple moving average, relative strength index and comparisons to the major indexes.

The portfolio outperformed all comparative investments. The final return on the active trading portfolio was 17.8 percent. If the initial portfolio had been maintained for the entire seven-week simulation using the buy-and-hold strategy, it would have yielded a 9.5 percent

return on the investment. During that seven-week simulation, the Dow Jones Industrial Average returned 3.5 percent, and the NASDAQ Composite returned 2.6 percent. These two indexes suggest that the market is currently outperforming the seventy-five year average annual return of the stock market. Short-term certificates of deposit have the lowest return, with the highest interest rates yielding around 1.25 percent annually. Looking at a CD investment over a seven-week period, the investment would have only generated a 0.17 percent return. An investment in a corporate bond would return an average of 4.5 percent annually, or a 0.61 percent return during the simulation time frame.

The simulation was successful in the fact that its goals were accomplished. When drawing final conclusions, it was important to keep the risk associated with the market in mind. The market had drastic fluctuations during the simulation. Had the simulation ended in the fourth week, the portfolio would not have yielded as high of a return. For example, an investment in the Dow Jones Industrial Average over the first four weeks would have yielded a loss of 0.2 percent. Annually the market has historically returned average losses as recently as 2008 when the S&P 500 Index of the NYSE recorded a loss of 37 percent, followed by the 22.1 percent loss recorded in 2002.⁶⁰

Ultimately, the simulation demonstrated that investing in stocks can return more on investments than alternative vehicles. Additionally, a higher return is possible when an investor dedicates more time to researching and tracking his or her portfolio. Learning how to spot trends and use indicators to help identify opportunities can help investors who follow the market closely make rewarding trade decisions. This experience will positively influence real-life investments in future years and provide a foundation for further research.

Chapter 7 – Appendix

Date	Symbol	Buy/ Sell	Price	Shares	Net Cost/ Proceeds	Profit/ Loss	Total Cash	Total Profit
6/1/16							\$500,000.00	
6/6/16	SAM	Buy	\$155.25	644	\$99,987.95		\$400,012.05	
6/6/16	XOM	Buy	\$88.87	1125	\$99,985.70		\$300,026.35	
6/6/16	MCD	Buy	\$121.79	821	\$99,996.54		\$200,029.81	
6/6/16	NKE	Buy	\$52.76	1895	\$99,987.15		\$100,042.66	
6/6/16	GE	Buy	\$30.00	3333	\$99,996.95		\$45.71	
6/13/16	GE	Sell	\$29.98	3333	\$99,916.39	(\$80.56)	\$99,962.10	(\$80.56)
6/13/16	SWHC	Buy	\$23.40	4270	\$99,924.95		\$37.15	
6/21/16	MCD	Sell	\$122.69	400	\$49,069.05	\$346.10	\$49,106.20	\$265.54
6/21/16	SWHC	Buy	\$24.31	2018	\$49,064.53		\$41.67	
6/24/16	XOM	Sell	\$90.10	1125	\$101,355.55	\$1,369.85	\$101,397.22	\$1,635.39
6/24/16	APPL	Buy	\$93.52	1083	\$101,289.11		\$108.11	
6/27/16	MCD	Sell	\$118.16	421	\$49,738.41	(\$1,542.13)	\$49,846.52	\$93.26
6/27/16	GOOG	Buy	\$671.00	74	\$49,660.95		\$185.57	
7/8/16	SWHC	Sell	\$29.75	2018	\$60,028.55	\$10,964.02	\$60,214.12	\$11,057.28
7/8/16	GOOG	Buy	\$699.50	86	\$60,163.95		\$50.17	
7/12/16	SWHC	Sell	\$28.50	2000	\$56,993.05	\$10,186.10	\$57,043.22	\$21,243.38
7/12/16	NTDOY	Buy	\$27.59	2065	\$56,980.30		\$62.92	
7/13/16	SAM	Sell	\$169.91	322	\$54,704.07	\$4,706.62	\$54,766.99	\$25,950.00
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7/18/16	MCD	Buy	\$124.00	308	\$38,198.95		\$27,158.64	
7/19/16	NKE	Sell	\$57.46	1895	\$108,879.75	\$8,892.60	\$136,038.39	\$46,995.90
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7/22/16	APPL	Sell	\$98.66	1083	\$106,841.83	\$5,552.72	\$238,314.20	\$76,771.34
7/22/16	GOOG	Sell	\$742.74	346	\$256,981.09	\$11,389.70	\$495,295.29	\$88,161.04
7/22/16	GE	Sell	\$32.06	1695	\$54,334.75	(\$352.90)	\$549,630.04	\$87,808.14
7/22/16	MCD	Sell	\$128.26	308	\$39,497.13	\$1,298.18	\$589,127.17	\$89,106.32

Table 10 - Complete Simulation Trade Log

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